

SEQUENCE LISTING

<110> FRANKEL, Fred R  
PORTNOY, Daniel A.

<120> ISOLATED NUCLEIC ACIDS COMPRISING LISTERIA DAL AND DAT GENES

<130> 053893-5011-02

<150> 09/520,207  
<151> 2000-03-07

<150> PCT/US98/24357  
<151> 1998-11-13

<150> 08/972,902  
<151> 1997-11-18

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<170> PatentIn version 3.1

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gctaatgcat atggtcacgg aattatcgaa gttgcttagga cggcggaaaga agctggagca 180  
aaagggtttct gcgttagccat ttttagatgag gcactggctc ttagagaagc tggatttcaa 240  
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aaccacattt cacttactgt ttttagagaa gattggctag agaatctaac gctagaagca 360  
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gaagaagcac ggcgaattga agcaaccagt actaatgatc accaattaca actggaaggt 480  
atttacacgc attttgcac agccgaccag ctagaaacta gtttatttga acaacaatta 540  
gctaagttcc aaacgatttt aacgagttt aaaaaacgac caacttatgt tcatacagcc 600  
aatttcagctg cttcattgtt acagccacaa atcggggttg atgcgattcg ctttggatt 660  
tcgatgtatg gattaactcc ctccacagaa atcaaaaacta gcttgcgcgtt tgagctaaa 720  
cctgcacttg cactctatac cgagatggtt catgtgaaag aacttgcacc aggcgatagc 780  
gttagctacg gagcaactta tacagcaaca gagcgagaat gggttgcgac attaccaatt 840

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 tttcaaactg gttcaaaagt aacgataatt ggcaaagatc atggtaacac ggttaacagca 1020  
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Val Asp Leu Trp Ala Val Val Lys Ala Asn Ala Tyr Gly His Gly Ile  
 35 40 45

Ile Glu Val Ala Arg Thr Ala Lys Glu Ala Gly Ala Lys Gly Phe Cys  
 50 55 60

Val Ala Ile Leu Asp Glu Ala Leu Ala Leu Arg Glu Ala Gly Phe Gln  
 65 70 75 80

Asp Asp Phe Ile Leu Val Leu Gly Ala Thr Arg Lys Glu Asp Ala Asn  
 85 90 95

Leu Ala Ala Lys Asn His Ile Ser Leu Thr Val Phe Arg Glu Asp Trp  
 100 105 110

Leu Glu Asn Leu Thr Leu Glu Ala Thr Leu Arg Ile His Leu Lys Val  
 115 120 125

Asp Ser Gly Met Gly Arg Leu Gly Ile Arg Thr Thr Glu Glu Ala Arg  
 130 135 140

Arg Ile Glu Ala Thr Ser Thr Asn Asp His Gln Leu Gln Leu Glu Gly  
 145 150 155 160

Ile Tyr Thr His Phe Ala Thr Ala Asp Gln Leu Glu Thr Ser Tyr Phe  
 165 170 175

Glu Gln Gln Leu Ala Lys Phe Gln Thr Ile Leu Thr Ser Leu Lys Lys  
 180 185 190

Arg Pro Thr Tyr Val His Thr Ala Asn Ser Ala Ala Ser Leu Leu Gln  
 195 200 205

Pro Gln Ile Gly Phe Asp Ala Ile Arg Phe Gly Ile Ser Met Tyr Gly  
 210 215 220  
 Leu Thr Pro Ser Thr Glu Ile Lys Thr Ser Leu Pro Phe Glu Leu Lys  
 225 230 235 240  
 Pro Ala Leu Ala Leu Tyr Thr Glu Met Val His Val Lys Glu Leu Ala  
 245 250 255  
 Pro Gly Asp Ser Val Ser Tyr Gly Ala Thr Tyr Thr Ala Thr Glu Arg  
 260 265 270  
 Glu Trp Val Ala Thr Leu Pro Ile Gly Tyr Ala Asp Gly Leu Ile Arg  
 275 280 285  
 His Tyr Ser Gly Phe His Val Leu Val Asp Gly Glu Pro Ala Pro Ile  
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 His Ile Met Ala Val Val Lys Ala Asn Ala Tyr Gly His Gly Asp Val  
 35 40 45  
 Gln Val Ala Arg Thr Ala Leu Glu Arg Gly Pro Pro Pro Ala Val Ala  
 50 55 60  
 Phe Leu Asp Glu Ala Leu Ala Leu Arg Glu Lys Gly Ile Glu Ala Pro  
 65 70 75 80  
 Ile Leu Val Leu Gly Ala Ser Arg Pro Ala Asp Ala Ala Leu Ala Ala  
 85 90 95

Gln Gln Arg Ile Ala Leu Thr Val Phe Arg Ser Asp Trp Leu Glu Glu  
 100 105 110  
 Ala Ser Ala Leu Tyr Ser Gly Pro Phe Pro Ile His Phe His Leu Lys  
 115 120 125  
 Met Asp Thr Gly Met Gly Arg Leu Gly Val Lys Asp Glu Glu Glu Thr  
 130 135 140  
 Lys Arg Ile Val Ala Leu Ile Glu Arg His Pro His Phe Val Leu Glu  
 145 150 155 160  
 Gly Leu Tyr Thr His Phe Ala Thr Ala Asp Glu Val Asn Thr Asp Tyr  
 165 170 175  
 Phe Ser Tyr Gln Tyr Thr Arg Phe Leu His Met Leu Glu Trp Leu Pro  
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 Ser Arg Pro Pro Leu Val His Cys Ala Asn Ser Ala Ala Ser Leu Arg  
 195 200 205  
 Phe Pro Asp Arg Thr Phe Asn Met Val Arg Phe Gly Ile Ala Met Tyr  
 210 215 220  
 Gly Leu Ala Pro Ser Pro Gly Ile Lys Pro Leu Leu Pro Tyr Pro Leu  
 225 230 235 240  
 Lys Glu Ala Phe Ser Leu His Ser Arg Leu Val His Val Lys Lys Leu  
 245 250 255  
 Gln Pro Gly Glu Lys Val Ser Tyr Gly Ala Thr Tyr Thr Ala Gln Thr  
 260 265 270  
 Glu Glu Trp Ile Gly Thr Ile Pro Ile Gly Tyr Ala Asp Gly Val Arg  
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 Arg Leu Gln His Phe His Val Leu Val Asp Gly Gln Lys Ala Pro Ile  
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 325 330 335  
 Val Ile Ser Ile Asp Asp Val Ala Arg His Leu Glu Thr Ile Asn Tyr  
 340 345 350  
 Glu Val Pro Cys Thr Ile Ser Tyr Arg Val Pro Arg Ile Phe Phe Arg  
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 Ser Ala  
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His Val His Leu Met Ala Val Glu Lys Ala Asn Ala Tyr Gly His Gly  
35 40 45  
  
Asp Ala Glu Thr Ala Lys Ala Ala Leu Asp Ala Gly Ala Ser Cys Leu  
50 55 60  
  
Ala Met Ala Ile Leu Asp Glu Ala Ile Ser Leu Arg Lys Lys Gly Leu  
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Lys Ala Pro Ile Leu Val Leu Gly Ala Val Pro Pro Glu Tyr Val Ala  
85 90 95  
  
Ile Ala Ala Glu Tyr Asp Val Thr Leu Thr Gly Tyr Ser Val Glu Trp  
100 105 110  
  
Leu Gln Glu Ala Ala Arg His Thr Lys Lys Gly Ser Leu His Phe His  
115 120 125  
  
Leu Lys Val Asp Thr Gly Met Asn Arg Leu Gly Val Lys Thr Glu Glu  
130 135 140  
  
Glu Val Gln Asn Val Met Ala Ile Leu Asp Arg Asn Pro Arg Leu Lys  
145 150 155 160  
  
Cys Lys Gly Val Phe Thr His Phe Ala Thr Ala Asp Glu Lys Glu Arg  
165 170 175  
  
Gly Tyr Phe Leu Met Gln Phe Glu Arg Phe Lys Glu Leu Ile Ala Pro  
180 185 190  
  
Leu Pro Leu Lys Asn Leu Met Val His Cys Ala Asn Ser Ala Ala Gly  
195 200 205  
  
Leu Arg Leu Lys Lys Gly Phe Phe Asn Ala Val Arg Phe Gly Ile Gly  
210 215 220  
  
Met Tyr Gly Leu Arg Pro Ser Ala Asp Met Ser Asp Glu Ile Pro Phe  
225 230 235 240  
  
Gln Leu Arg Pro Ala Phe Thr Leu His Ser Thr Leu Ser His Val Lys  
245 250 255  
  
Leu Ile Arg Lys Gly Glu Ser Val Ser Tyr Gly Ala Glu Tyr Thr Ala  
260 265 270

Glu Lys Asp Thr Trp Ile Gly Thr Val Pro Val Gly Tyr Ala Asp Gly  
275 280 285

Trp Leu Arg Lys Leu Lys Gly Thr Asp Ile Leu Val Lys Gly Lys Arg  
290 295 300

Leu Lys Ile Ala Gly Arg Ile Cys Met Asp Gln Phe Met Val Glu Leu  
305 310 315 320

Asp Gln Glu Tyr Pro Pro Gly Thr Lys Val Thr Leu Ile Gly Arg Gln  
325 330 335

Gly Asp Glu Tyr Ile Ser Met Asp Glu Ile Ala Gly Arg Leu Glu Thr  
340 345 350

Ile Asn Tyr Glu Val Ala Cys Thr Ile Ser Ser Arg Val Pro Arg Met  
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Val Asn Ile Ser Asn  
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<213> Listeria monocytogenes

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gttattcctt attccaaaga agagctacgt gaattacttg aaaaatttgt tgccgaaaaat 240

aatatcaata cagggaatgt ctatttacaa gtgactcgtg gtgttcaaaa cccacgttaat 300

catgtaatcc ctgatgattt ccctctagaa ggcgttttaa cagcagcagc tcgtgaagta 360

cctagaaacg agcgtcaatt cggttgaaggt ggaacggcga ttacagaaga agatgtgcgc 420

tggttacgct gtgatattaa gagcttaaac cttttaggaa atattcttagc aaaaaataaa 480

gcacatcaac aaaatgctt ggaagctatt ttacatcgcg gggacaagt aacagaatgt 540

tctgcttcaa acgtttctat tattaaagat ggtgtattat ggacgcattgc ggcagataac 600

ttaatcttaa atggtatcac tcgtcaagtt atcattgtat ttgcgaaaaa gaatggcatt 660

cctgttaaag aagcggattt cacttaaca gaccttcgtg aagcggatga agtggatcatt 720

tcaagtacaa ctattgaaat tacacctatt acgcattttc acggagttca agtagctgac 780

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Val Val Arg Leu Tyr Asn Gly Lys Phe Phe Thr Tyr Asn Glu His Ile  
 35 40 45

Asp Arg Leu Tyr Ala Ser Ala Ala Lys Ile Asp Leu Val Ile Pro Tyr  
 50 55 60

Ser Lys Glu Glu Leu Arg Glu Leu Leu Glu Lys Leu Val Ala Glu Asn  
 65 70 75 80

Asn Ile Asn Thr Gly Asn Val Tyr Leu Gln Val Thr Arg Gly Val Gln  
 85 90 95

Asn Pro Arg Asn His Val Ile Pro Asp Asp Phe Pro Leu Glu Gly Val  
 100 105 110

Leu Thr Ala Ala Ala Arg Glu Val Pro Arg Asn Glu Arg Gln Phe Val  
 115 120 125

Glu Gly Gly Thr Ala Ile Thr Glu Glu Asp Val Arg Trp Leu Arg Cys  
 130 135 140

Asp Ile Lys Ser Leu Asn Leu Leu Gly Asn Ile Leu Ala Lys Asn Lys  
 145 150 155 160

Ala His Gln Gln Asn Ala Leu Glu Ala Ile Leu His Arg Gly Glu Gln  
 165 170 175

Val Thr Glu Cys Ser Ala Ser Asn Val Ser Ile Ile Lys Asp Gly Val  
 180 185 190

Leu Trp Thr His Ala Ala Asp Asn Leu Ile Leu Asn Gly Ile Thr Arg  
 195 200 205

Gln Val Ile Ile Asp Val Ala Lys Lys Asn Gly Ile Pro Val Lys Glu  
 210 215 220

Ala Asp Phe Thr Leu Thr Asp Leu Arg Glu Ala Asp Glu Val Phe Ile  
 225 230 235 240

Ser Ser Thr Thr Ile Glu Ile Thr Pro Ile Thr His Ile Asp Gly Val  
 245 250 255  
 Gln Val Ala Asp Gly Lys Arg Gly Pro Ile Thr Ala Gln Leu His Gln  
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 Tyr Phe Val Glu Glu Ile Thr Arg Ala Cys Gly Glu Leu Glu Phe Ala  
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 Tyr

Lys

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 Phe Glu Arg Phe Ile Arg Ser Ala Ser Glu Ile Gln Leu Asp Leu Gly  
 50 55 60  
 Tyr Thr Val Glu Glu Leu Ile Asp Val Val Arg Glu Leu Leu Lys Val  
 65 70 75 80  
 Asn Asn Ile Gln Asn Gly Ile Tyr Ile Gln Ala Thr Arg Gly Val  
 85 90 95  
 Ala Pro Arg Asn His Ser Phe Pro Thr Pro Glu Val Lys Pro Val Ile  
 100 105 110  
 Met Ala Phe Ala Lys Ser Tyr Asp Arg Pro Tyr Asp Asp Leu Glu Asn  
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 Gly Ile Asn Ala Ala Thr Val Glu Asp Ile Arg Trp Leu Arg Cys Asp  
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 Ile Lys Ser Leu Asn Leu Leu Gly Asn Val Leu Ala Lys Glu Tyr Ala  
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 Val Lys Tyr Asn Ala Gly Glu Ala Ile Gln His Arg Gly Glu Thr Val  
 165 170 175  
 Thr Glu Gly Ala Ser Ser Asn Val Tyr Ala Ile Lys Asp Gly Ala Ile  
 180 185 190  
 Tyr Thr His Pro Val Asn Asn Tyr Ile Leu Asn Gly Ile Thr Arg Lys  
 195 200 205

Val Ile Lys Trp Ile Ser Glu Asp Glu Asp Ile Pro Phe Lys Glu Glu  
210 215 220

Thr Phe Thr Val Glu Phe Leu Lys Asn Ala Asp Glu Val Ile Val Ser  
225 230 235 240

Ser Thr Ser Ala Glu Val Thr Pro Val Val Lys Ile Asp Gly Glu Gln  
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Glu Val Ile Lys Val Tyr Asn Gly His Met Phe Thr Ala Gln Glu His  
35 40 45

Ile Asp Arg Phe Tyr Ala Ser Ala Glu Lys Ile Arg Leu Val Ile Pro  
50 55 60

Tyr Thr Lys Asp Val Leu His Lys Leu Leu His Asp Leu Ile Glu Lys  
65 70 75 80

Asn Asn Leu Asn Thr Gly His Val Tyr Phe Gln Ile Thr Arg Gly Thr  
85 90 95

Thr Ser Arg Asn His Ile Phe Pro Asp Ala Ser Val Pro Ala Val Leu  
100 105 110

Thr Gly Asn Val Lys Thr Gly Glu Arg Ser Ile Glu Asn Phe Glu Lys  
115 120 125

Gly Val Lys Ala Thr Leu Val Glu Asp Val Arg Trp Leu Arg Cys Asp  
130 135 140

Ile Lys Ser Leu Asn Leu Leu Gly Ala Val Leu Ala Lys Gln Glu Ala  
145 150 155 160

Ser Glu Lys Gly Cys Tyr Glu Ala Ile Leu His Arg Gly Asp Ile Ile  
165 170 175

Thr Glu Cys Ser Ser Ala Asn Val Tyr Gly Ile Lys Asp Gly Lys Leu  
180 185 190

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Val	Ile	Leu	Lys	Cys	Ala	Ala	Glu	Ile	Asn	Leu	Pro	Val	Ile	Glu	Glu
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Pro	Met	Thr	Lys	Gly	Asp	Leu	Leu	Thr	Met	Asp	Glu	Ile	Ile	Val	Ser
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Ser	Val	Ser	Ser	Glu	Val	Thr	Pro	Val	Ile	Asp	Val	Asp	Gly	Gln	Gln
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Ile	Gly	Ala	Gly	Val	Pro	Gly	Glu	Trp	Thr	Arg	Lys	Leu	Gln	Lys	Ala
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Glu	Val	Val	Lys	Val	Tyr	Asn	Gly	Glu	Met	Phe	Thr	Val	Asn	Glu	His
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Ile	Asp	Arg	Leu	Tyr	Ala	Ser	Ala	Glu	Lys	Ile	Arg	Ile	Thr	Ile	Pro
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Tyr	Thr	Lys	Asp	Lys	Phe	His	Gln	Leu	Leu	His	Glu	Leu	Val	Glu	Lys
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Asn	Glu	Leu	Asn	Thr	Gly	His	Ile	Tyr	Phe	Gln	Val	Thr	Arg	Gly	Thr
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Ser	Pro	Arg	Ala	His	Gln	Phe	Pro	Glu	Asn	Thr	Val	Lys	Pro	Val	Ile
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Ile	Gly	Tyr	Thr	Lys	Glu	Asn	Pro	Arg	Pro	Leu	Glu	Asn	Leu	Glu	Lys
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Gly	Val	Lys	Ala	Thr	Phe	Val	Glu	Asp	Ile	Arg	Trp	Leu	Arg	Cys	Asp
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Ile	Lys	Ser	Leu	Asn	Leu	Leu	Gly	Ala	Val	Leu	Ala	Lys	Gln	Glu	Ala
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His	Glu	Lys	Gly	Cys	Tyr	Glu	Ala	Ile	Leu	His	Arg	Asn	Asn	Thr	Val
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															170
															175

Thr Glu Gly Ser Ser Ser Asn Val Phe Gly Ile Lys Asp Gly Ile Leu  
180 185 190  
Tyr Thr His Pro Ala Asn Asn Met Ile Leu Lys Gly Ile Thr Arg Asp  
195 200 205  
Val Val Ile Ala Cys Ala Asn Glu Ile Asn Met Pro Val Lys Glu Ile  
210 215 220  
Pro Phe Thr Thr His Glu Ala Leu Lys Met Asp Glu Leu Phe Val Thr  
225 230 235 240  
Ser Thr Thr Ser Glu Ile Thr Pro Val Ile Glu Ile Asp Gly Lys Leu  
245 250 255  
Ile Arg Asp Gly Lys Val Gly Glu Trp Thr Arg Lys Leu Gln Lys Gln  
260 265 270  
Phe Glu Thr Lys Ile Pro Lys Pro Leu His Ile  
275 280